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MINERAL COMMODITY REPORT

—— GYPSUM ——

1984

CALIFORNIA DEPARTMENT OF CONSERVATION
DIVISION OF MINES AND GEOLOGY

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SPECIAL PUBLICATION 72

MINERAL COMMODITY REPORT

—— GYPSUM ——

1984

By
JOHN L. BURNETT

Part I from
U.S. Bureau of Mines publication,
Mineral Commodity Summaries, 1984

CALIFORNIA DEPARTMENT OF CONSERVATION
DIVISION OF MINES AND GEOLOGY
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INTRODUCTION

This report on the availability and demand for gypsum in California, the United States, and the world is one of the series of Mineral Commodity Reports prepared by the Department of Conservation, Division of Mines and Geology (DMG) to describe commodities of significance to California and the nation.

This mineral commodity report was compiled by John L. Burnett of the DMG geologic staff. Part I consists of United States and world-wide mineral statistic information and analysis adopted directly from the U.S. Bureau of Mines "Mineral Commodity Summaries, 1984." Part II discusses production of the commodity in California. The U.S. Bureau of Mines presents the earliest Government estimates of non-fuel mineral-industry data, including world resource data provided by the U.S. Geological Survey.

Gypsum is basic to two very important industries in California, construction and agriculture. Gypsum is the basic raw material in the manufacture of wallboard. Use of wallboard in new construction is on the increase due to its low cost and resistance to fire. In agriculture, gypsum is used to neutralize excess alkalinity in soil. This use is also on the increase as more acres in desert areas are brought under cultivation with irrigation projects.

Twelve areas containing potentially mineable gypsum deposits are described as well as other localities which are smaller or depleted. Total production in the state is valued at over $10,000,000 annually.

The current rapid expansion in the housing industry foretells a bright future for gypsum although byproduct material may partially replace mined rock.

For further information, please call (916) 445-5716, the DMG centralized information number.

PART I: UNITED STATES AND WORLDWIDE

1. UNITED STATES PRODUCTION AND USE

Gypsum: In 1983, output of crude gypsum was 12.2 million tons valued at $110 million, an increase of 16% in tonnage compared with 1982. Leading states were Texas, Oklahoma, Iowa, California, Michigan, and Nevada, which together accounted for 64% of the total. Forty-five companies mined crude gypsum at 71 mines in 22 states, and 14 companies calcined gypsum at 69 plants in 30 states. Of the total supply of crude gypsum, 20.9 million tons, including 550,000 tons of byproduct gypsum, 16.6 million tons was calcined for gypsum products, and 4.3 million tons was used mainly as a cement retarder or as agricultural land plaster. The calcined gypsum was sold as prefabricated products or as industrial or building plaster. Sales of gypsum for use in cement were 3.0 million tons; for agriculture, 1.2 million tons; and for industrial and building plaster, 725,000 tons.

Available capacity of operating gypsumboard plants in the United States at yearend 1982 was 19.5 billion square feet per year. Sales of gypsumboard products were 16.6 billion square feet, which represented a capacity utilization of 85%.

2. SALIENT STATISTICS -- UNITED STATES

	1979	1980	1981	1982	1983[e]
Production:					
Crude	14,630	12,376	11,497	10,538	12,200
Byproduct	828	663	696	697	550
Calcined	14,543	11,848	11,687	11,243	13,400
Prefabricated products (million square feet):	16,729	14,144	13,754	13,086	16,600
Imports: Crude including anhydrite	7,773	7,365	7,593	6,718	8,300
Exports: Crude, crushed or calcined	91	88	157	123	125
Consumption: Crude, apparent[1]	22,967	21,013	19,288	17,383	20,900
Price: Average crude (f.o.b. mine) dollars per ton	$ 6.83	$ 8.33	$ 8.53	$ 8.46	$ 9.00
Average calcine (f.o.b. plant) dollars per ton	$30.40	$22.82	$20.80	$17.48	$19.20
Stocks: Producer, crude, yearend[e]	3,900	3,203	3,544	3,991	4,000
Employment: Mine and calcining plant	5,400	5,300	5,300	4,900	5,300
Net import reliance[2] as a percent of apparent consumption	35	35	37	36	

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e Estimate.

1 Apparent consumption = crude + byproduct + imports-exports + industry stock adjustment.

2 Net import reliance = imports-exports + adjustments for Government and industry stock changes.

3. RECYCLING

Byproduct gypsum generated in flue gas desulfurization, phosphate rock acidulation, and other chemical processes is not reclaimed, except for a small amount sold for agricultural purposes.

4. IMPORT SOURCES (1979-82)

Canada 74%, Mexico 21%, Spain 3%, Other 2%.

5. TARIFF

Item	Number	Most Favored Nation (MFN)		Non-MFN
		1/1/84	1/1/87	1/1/84
Crude	512.21	Free	Free	Free
Ground, wholly or partly calcined	512.24	48¢/l.t.	42%/l.t.	$1.40/l.t.
Gypsum or plaster building board	245.70	3.8% ad val.	2.4% ad val.	30% ad val.

6. DEPLETION ALLOWANCE

14% (Domestic), 14% (Foreign).

7. GOVERNMENT STOCKPILE

None

8. EVENTS, TRENDS, AND ISSUES

The gypsum industry in 1983 followed the high activity of the construction and housing industry, with 1.7 million housing starts, a 70% increase compared with 1982. Production of domestic crude gypsum increased 16%, imports increased 24%, and sales of prefabricated products increased 27%.

The gypsum wallboard industry modestly increased shipments in the first half of 1983, and then, spurred by lower interest rates and the pent-up demand for housing, increased shipments very rapidly with new monthly records in the second half of the year. Total wallboard shipments for 1983 were 16.6 billion square feet, up 27% from 1982 and only 1% less than the record year of 1979. Most plants were on allocation to their best customers, and operated 160 of a weekly maximum of 168 hours. Some spot shortages developed in retail outlets and contractor requirements. The average price of wallboard in 19 principal cities increased about 15% from beginning to yearend. Imports of wallboard from Canada were 250 million square feet, 49% more than that of 1982, but 27% less than the record year of 1979. One plant was dismantled in 1983, one new plant came onstream, and two other plants remained dormant, resulting in an operational gypsumboard capacity of 19.5 billion square feet per year.

As long as the cost of land for solid waste disposal continues to be economical and solid waste pollution remains noncritical, only a small amount of the potentially useful byproduct gypsum scrubbed from power plant stack gases and produced by chemical plants will be recycled.

From a 1981 base, demand for gypsum is expected to increase at an annual rate of about 3.3% through 1990. It is estimated that in 1984 domestic mine production of gypsum will be 12.6 million tons and U.S. apparent consumption will be 21 million tons.

9. WORLD MINE PRODUCTION AND RESERVE BASE

	Production		Reserve Base*
	1982	1983e	
United States	10,538	12,200	700,000
Canada	6,312	7,500	500,000
France	6,800	6,800	
Germany, Federal Republic of	2,500	2,500	
Iran	5,500	5,200	
Italy	1,800	1,900	Reserves are large
Mexico	1,700	1,900	in major producing
Spain	5,800	5,900	countries but data
United Kingdom	3,000	3,200	are not available.
Other Market Economy Countries	21,751	19,000	
China	3,900	3,900	
Poland	1,400	1,400	
Romania	1,800	1,800	
U.S.S.R.	6,000	6,000	
Other Centrally Planned Economies	1,815	1,800	
World Total	80,600	81,000	

10. WORLD RESOURCES

Domestic resources are adequate but are unevenly distributed. There are no gypsum deposits on the eastern seaboard of the United States, and large imports from Canada augment the domestic supply of crude ore in these industrial areas. Large deposits occur in the Great Lakes region, mid-continent region, California, and in other States. Foreign resources are adequate but are not evenly distributed.

11. SUBSTITUTES AND ALTERNATES

Other construction materials may be substituted for gypsum, especially lime, lumber, cement, steel, or masonry. There is no practical substitute for gypsum in portland cement. Byproduct gypsum is presently substituting for crude gypsum in special agricultural applications, and may, in time, be utilized in place of crude gypsum for cement set-retarding and manufacturing wallboard.

* Pending establishment of criteria for the reserve base, classification of data is based on a judgmental appraisal of current knowledge and assumptions.

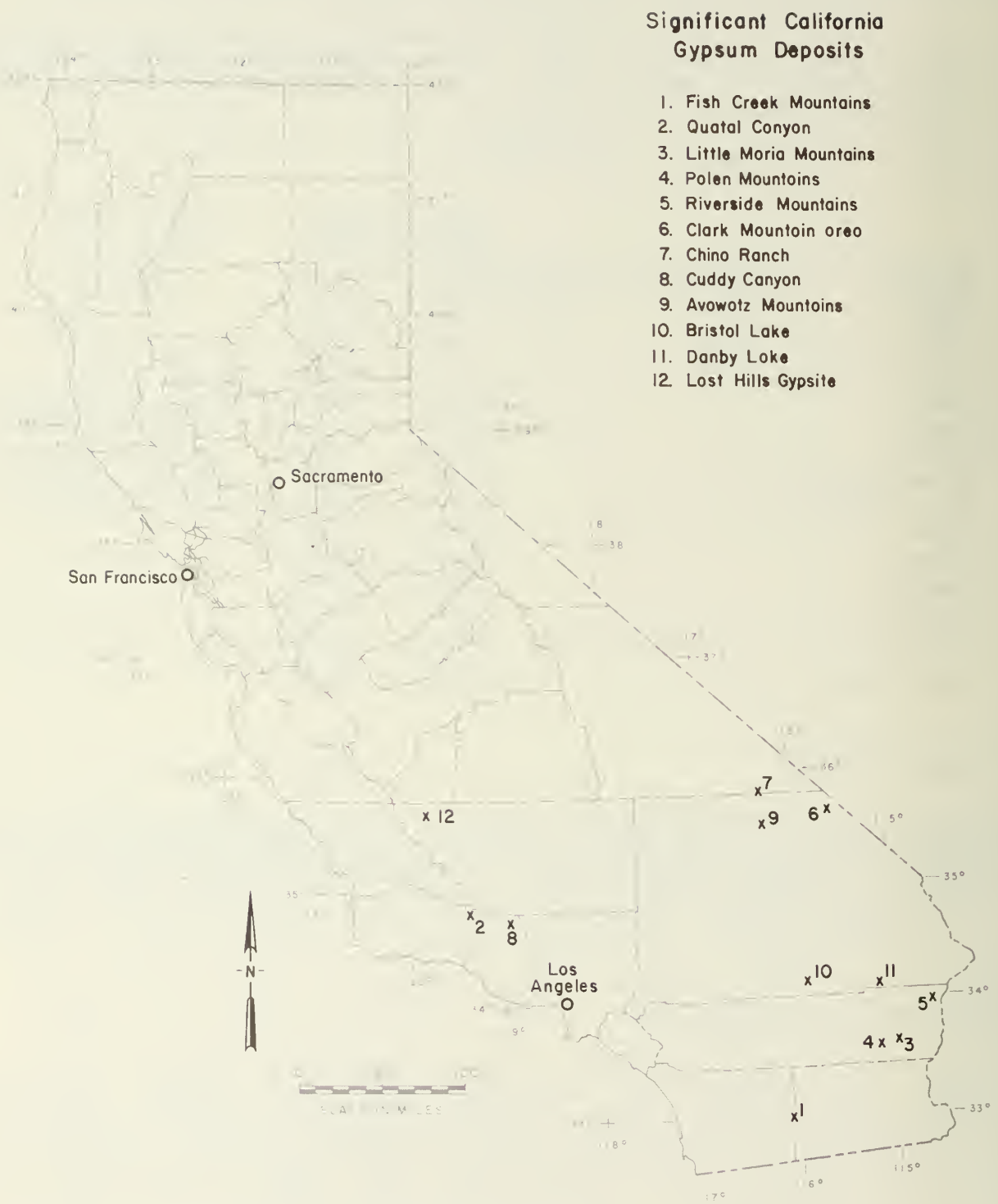

Figure 1. Locations of California gypsum deposits

PART II: CALIFORNIA

12. CALIFORNIA GEOLOGICAL OCCURRENCES

Potentially mineable deposits of high-purity gypsum are found in only one geologic environment, lake beds resulting from the total or near total evaporation of inland bodies of water. These deposits range in age throughout the geologic time scale from Holocene materials along the margins of some playas in the California desert to probable Paleozoic materials such as in the Little Maria Mountains near Blythe (Figure 1). Gypsum from these deposits are commonly 90% pure, the remainder being silica and limestone.

Impure deposits of gypsum with clay or silt are called gypsite. These deposits are Holocene in age and result from the evaporation of calcium sulfate-bearing ground water in hot, dry areas where the underlying sedimentary rocks contain a small percentage of gypsum. Some of these deposits have formed in the beds of dry washes that carried calcium sulfate-bearing water during periods of higher rainfall.

Holocene deposits of gypsite: Gypsite is an unconsolidated, earthy mixture of finely divided gypsum and clay, silt or sand. In the past, material could be produced which contained 80 percent or more of gypsum but as deposits have been exhausted, the best material now guarantee a minimum gypsum content of 55 percent.

The deposits usually are near or at the ground surface, and form in regions of little rain and high evaporation. Capillary action draws calcium sulfate-bearing ground water toward the surface where very small crystals of gypsum form. Three types of gypsite deposits have been recognized:

1. Those that form caps on the upturned edges of gypsiferous beds. These are probably the most numerous. The gypsum in the source beds may be: selenite crystals and cleavage plates; part of the cement of sandstones; a network of satin spar veins; or thin layers of gypsum interbedded with shale. The overlying gypsite bodies closely parallel the present surface except that the thin overburden of soil is likely to be thinner on hillsides than it is toward the base.

2. Those that occur along the margins of periodic lakes. Efflorescent deposits have formed along the shoreline from calcium sulfate dissolved in the damp underlying soil even though the lake water may never have been saturated with gypsum (Hess, 1920).

3. Those near McKittrick that have formed in the beds of dry washes resulting in long, narrow, crooked bodies covered by slightly consolidated sand and gravel. The gypsite may have been washed in from surrounding deposits as sedimentary grains or originated from gypsiferous ground water. Most of the gypsite deposits on the western margin of the San Joaquin Valley have been depleted by past mining, and since these deposits are genetically related to the ground

surface, it is unlikely that additional reserves will be found at depth. The sole exception are the Lost Hills gypsite deposits operated by H.M. Holloway, Inc., which may have several decades of future production.

Other probably uneconomic deposits of gypsum are present in some Califonria metal mines. Large masses of gypsum and anhydrite are present in the deeper levels of the Bully Hill and Rising Star copper-zinc mines in Shasta County. These materials are thought to be, at least partly, of hydrothermal origin (Withington, 1966).

A final but very important local source is byproduct gypsum. California annually consumes 450,000 metric tons of gypsum derived from the production of superphosphate fertilizers and titanium dioxide pigment for paint (Pressler, unpublished). This byproduct material is fine-grained and wet so that it is not suitable for wallboard or cement retarder but is suitable for agricultural gypsum. Future, more rigid, air-pollution regulations may require desulfurization of all industrial fossil fuels. By the year 1990, byproduct gypsum produced from imported crude ore may exceed 30 million metric tons per year.

A substantial part of finished gypsum products manufactured in California uses raw materials imported from elsewhere. Crude ore is brought in from Nevada and San Marcos Island near Santa Rosalia, Baja California, Mexico in the Gulf of California.

13. CALIFORNIA LOCALITIES

Imperial and San Diego Counties: Fish Creek Mountains Deposit (T.13S, R.9E, SBM).

The largest gypsum mine in the United States is located in Miocene rocks at the northern end of the Fish Creek Mountains. The mined rock is hauled by narrow-gauge railway 25 miles to the U.S. Gypsum plant at Plaster City on County Road 580.

The gypsum is within the Split Mountain Formation, which rests with depositional unconformity on pre-Tertiary, coarse-grained gneiss and gneissic granite. The Split Mountain Formation is composed of poorly-consolidated, continental sandstone and coarse-grained conglomerate. At least 100 feet of pure, massive gypsum lies at the top of the formation. It is compact, equigranular and fine to medium grained. The deleterious material anhydrite is not found near the surface but is present about 120 feet vertically below the crest of the quarry face.

The principal structural feature in the vicinity of the quarry is an open syncline bounded by faults. The axis of this syncline lies under the alluvium in the wash west of the quarry. The gypsum beds and sediments of the Split Mountain Formation reappear on the western limb of this syncline across this wash. The Split Mountain Formation thins to the southeast and some gypsum bodies there rest directly on the meta-igneous basement complex.

The existing gypsum deposits are erosional remnants of a formerly-thicker bed that covered a much larger area and considerably more reserves may be covered by alluvium. A well prospecting for water on Fish Creek Wash north of the quarry passed through 115 feet of alluvium, 115 feet of pure gypsum and bottomed in granitic basement rock (Alan Rowley, private communication, 1984).

Celestite ($SrSO_4$) associated with the gypsum at the northwestern end of this deposit was mined during World War II to manufacture pyrotechnique chemicals.

Ventura County: Quatal Canyon (T.9N, R.23W, Sec. 18 and 19; T.9N, R.24W, Sec. 24, SBM).

Gypsum occurs about 5 miles east of Ventucopa on U.S. Highway 299 in the eastern part of Cuyama Valley. The gypsum is found at the base of a non-marine section of the Miocene Santa Margarita Formation and overlies the Miocene Caliente red beds. The quarry is on the southwest flank of a northwest-trending anticline. The gypsum bed ranges from 10 to 30 feet in thickness and in some places contains as much as 5 feet of interbedded shale. The gypsum is a brown-colored, compact aggregate of grains. The brown color does not affect the purity of the gypsum, or its use in the finished products.

Riverside County: Little Maria Mountains Deposits (T.4S, R.20E, Sec. 2, 10, 11, SBM).

These deposits, near Midland, north of Blythe, are in Palozoic rocks of possibly Silurian age. Deposits similar to these are found in the Palen and the Riverside Mountains; all three deposits may be associated with a single gypsum-rich horizon.

The gypsum occurs with crystalline limestone, quartzite and green schistose rocks that trend N70°E across the range. The gypsum, interbedded with buff limestone, is found in layers up to 100 feet thick traceable for several thousand feet, or as less persistent lenses. Commonly less than half is pure gypsum. The gypsum is a coarse-grained aggregate of flaky, transparent crystals up to 1/10 of an inch in diameter. Some beds grade into schist or tremolitic limestone. Although not plentiful, anhydrite has been found in the deepest part of the Fannin Superior quarry, and it is believed to be the source of the gypsum.

Only one deposit is being worked at the present time. The quarry, formerly operated by Utah Construction Company, was acquired by the Fannin interests to form the Fannin Superior Gypsum Co., Inc. The mill is located at Inca Siding on the Santa Fe Railway.

Riverside County: Palen Mountains Deposits (T.3S, R.18E, Sec. 2, 3, 4, 9, 10, 11, SBM).

A large deposit of gypsum is present south of Palen Pass in the Palen Mountains. The gypsum occurs in a series of Paleozoic(?) meta-sediments

that includes marble, quartzite and their thermally metamorphosed derivatives. The sedimentary rocks have been metemorphosed by the intrusion of a sill-like body of mafic rock which has itself been converted to a strongly foliated, fine-grained schist. The thermal effects of this meta-igneous rock is believed to have converted the gypsum to anhydrite; weathering has reconverted the anhydrite to gypsum near the surface. Folding, faulting, brecciation, shearing and jointing is pervasive.

Five lithologic bands can be distinguished which are from north to south:

1. Meta-sediments
2. Meta-igneous rock
3. Meta-sediments
4. Porphyroblastic meta-igneous rock
5. Meta-sediments

Potentially economic gypsum is found in three places:

a. The eastern end of band 5;
b. The eastern end of band 3; and
c. Band 1.

The gypsum occurs in massive beds of high purity up to 100 feet thick that are interbedded with marble and quartzite.

Although mineral exploration and development activity has taken place in the region, there has been no mining, and no known deep exploration drilling.

Riverside County: Riverside Mountains Deposit (T.2S, R.24E, NW corner, SBM).

A large deposit of pre-Tertiary (possibly Paleozoic) gypsum occurs on the east face of the Riverside Mountains 4 miles south of Vidal. Development work consists of short tunnels and test pits. Relief is extreme and road construction would be difficult.

The gypsum occurs in two zones (stratigraphic thickness 100 and 200 feet) that strike northwestward and dip 50° to the southwest. The gypsum is coarsely crystalline, white and interbedded with crystalline limestone and red quartzite.

San Bernardino County: Clark Mountain area (T.17N, R.14E, Sec. 5, SBM).

Undeveloped deposits of gypsum occur in northeastern San Bernardino County, north of Clark Mountain, associated with pre-Cretaceous metasedimentary rock.

Two or more gypsum beds, striking N40°W crop out for 1 to 2 miles along a large wash. Beds of gypsum more than 50 feet thick occur with sediments that include cherty limestone, sandy limestone and shale.

Inyo County: China Ranch Deposit (T.20N, R.7E, Sec. 26, SBM).

Gypsum is exposed along China Ranch Road, which extends southwestward from the Tecopa-Excelsior Mine road near the southern boundary of Inyo County. The gypsum occurs as beds up to 20 feet in thickness within a thick sequence of tilted lake beds of probable Pliocene age. Underground mining methods have been used.

Kern County: Cuddy Canyon Deposit (T.9N, R.21W, Sec. 34, SBM).

A gypsum deposit 2 miles west of Frazier Park, on the south side of Cuddy Canyon has been developed by an inclined shaft. Gypsum lenses are interbedded with brown sandstone, conglomerate, and volcanic rocks of possible Miocene age. Bedding strikes N75W and dips 20° to 85° south.

San Bernardino County: Avawatz Mountains Deposits (extends from T.17N, R.6E, Sec. 8, to T.18N, R.4E, Sec. 24, SBM).

Gypsum, salt, and celestite beds occur in a belt of strongly folded and faulted Tertiary beds that are exposed in the northern foothills of the Avawatz Mountains. These beds crop out in a belt 9 miles long and a mile wide that extends from Sheep Creek Spring northwestward across the southernmost boundary of Death Valley National Monument. The gypsum occurs in lake beds of late Miocene or early Pliocene age which are disturbed by the Death Valley fault zone.

San Bernardino County: Bristol Lake (T.5N, R.12E, Sec. 3 and 10, SBM).

The most important source of playa gypsum in California is Bristol Dry Lake near Amboy. The playa is filled with brine-saturated, fine sediments covered by a hard, salt-crusted surface. Gypsum crystals and celestite nodules are found in the mud along the lake margin, most abundantly on the west and north sides, 3 feet below the surface.

San Bernardino County: Danby Lake (T.2N, R.17E, to T.1N, R.18E, SBM).

This playa contains abundant selenite gypsum crystals along its northeastern margin. In some areas, gypsum makes up one third of the material filling the playa. Where gypsum is abundant, knobs as much as 15 yards across have formed that project 5 or 10 feet above the lake surface. They are formed of silt mixed with gypsum crystals and probably form by the upward movement and evaporation of water.

Other gypsum deposits: Lesser deposits include the following. (For additional detail, refer to Ver Planck, 1963):

Copper Canyon Deposit	Inyo County	Northeastern part of T.23N, R.2E, SBM	Lake beds of the Pliocene(?) Furnace Creek Formation. Pure gypsum beds up to 5 feet thick.

Furnace Creek Deposit	Inyo County	State Highway 190, 5 miles east of Furnace Creek Inyo	Pliocene(?) Furnace Creek Formation. A maximum of 3 feet of pure gypsum.
Owl Hole Spring Deposit	San Bernardino County	T.18N, R.3E, SBM	Pliocene(?) lake beds. A 2-foot layer of gypsum.
Mint Canyon Deposit	Los Angeles County	T.5N, R.14W, W. part of Sec. 29, SBM. Beds up to 6 inches thick of grey and brown gypsum.	Lower Miocene(?) Vasquez Formation.
Mule Shoe Ranch Deposit	San Benito County	T.18S, R.9E, Sec. 17, and 18, MDM.	Pleistocene Paso Robles Formation. Flat-lying lenses of gypsum 3 to 6 feet thick.
Santa Barbara Canyon Deposit	Santa Barbara & Ventura Counties	T.9N, R.25W, SE 1/4 Sec. 34, and SW 1/4 Sec. 35	All gypsum occurs in the middle Miocene Caliente red beds. Gypsum in beds which thicken to a maximum of 50 feet.
Wagon Road Canyon		T.9N, R.25W, Sec.36 SBM	
Wagon Road Canyon		T.8N, R.24W, Sec. 1SBM	
Seeley Property		T.8N, R.24W, NW 1/4 Sec. 18 and SW 1/4 Sec. 7, SBM	

Kern County: Lost Hills Deposit (T.26S, R.20E, Sec. 3, 10, 11, 14, 15, 23, 24, 25 and 26, MDM).

These deposits are scattered along the western side of the Lost Hills for about 4 miles. Flat-lying lenses of gypsite occur in slightly consolidated silty sand that contains lenses of gravel. Near the center of the lenses, the gypsite is nearly white and sugary while toward the edges it grades into crusty gray silt containing streaks and spots of white gypsite.

The other gypsite deposits are summarized below:

Koehn Lake Deposit	Kern County	T.30S, R.38E, Sec. 28, MDM	A lake-margin deposit of gypsite southwest of Koehn Dry Lake. The deposit was overlain by 1 or 2 feet of soil. The gypsite is white and fine-grained.

KcKittrick Deposits	Kern County	T.30S, R.22E, Sec. 21, 30, 31,32, T.31S, R.22E, Sec. 5 and 8, MDM.	Once-extensive deposits of gypsite southwest of McKittrick in the Telephone Hills. Gypsiferous beds in the Maricopa shale and the Tulare Formation were the source. The gypsite beds averaged 3 feet in thickness and were covered by soil. These deposits are long, sinuous bodies formed in the beds of dry washes.
Packwood Canyon Deposit	Kern County	T.27S, R.18E, Sec. 9, MDM	The deposit is a dry-wash body covered by several feet of silt. The gypsum is derived from a shale member of the Miocene Monterey Formation.
Avenal Gap Mine	Kings County	T.24S, R.18E, Sec. 2, 3, and 11, MDM	Probably a lake-margin type of deposit. The gypsite averaged 6 feet in thickness but the upper 2 feet was impure. The more pure gypsite is fine-grained, soft and yellowish-white.

Other known gypsite deposits are either depleted or unavailable due to other development. They are: Palmdale Deposits in Los Angeles County; Sousa Deposit in Merced County; Corona Deposits in Riverside County; Carrisa Mine in San Luis Obispo County; Shandon Deposit in San Luis Obispo County; and Fillmore Deposit in Ventura County.

14. CALIFORNIA PRODUCTION

Total production of gypsum in the state is valued at over $10 million annually.

15. UTILIZATION AND MARKETS

The three large markets for gypsum are the manufacture of wallboard, as a retarder in Portland cement and as a soil additive to reduce alkalinity. Applications for wallboard and cement retarder are closely tied to the health of the economy and housing starts. In a long-term view, probably half of the gypsum used in California has been as a soil additive, and wallboard and cement retarder account for one quarter each.

Anhydrite, which is found at depth in all of the gypsum deposits, is considered to be deleterious. In wallboard, it has no crystalline water to lose during calcination so it does not set-up when a plaster body is formed. In Portland cement, it accelerates rather than retards the setting time. Because anhydrite is less soluble than gypsum, it is much less effective than gypsum as a soil additive.

16. MINING METHODS AND BENEFICIATION

Since gypsum is one of the softest of minerals and the rock is easily broken, it can readily be mined with earthmoving equipment. When crushed prior to calcining, these properties result in low power costs and minimal wear on the equipment. The gypsum is mined and crushed for use as a soil additive and cement retarder. When making wallboard, the gypsum is mined, crushed and calcined to reduce gypsum ($CaSO_4.2H_2O$) to the hemihydrate ($CaSO_4.1/2\ H_2O$). This then is mixed with water and formed into board. The hemihydrate recombines with the water and crystallizes in 7 to 8 minutes. At the end of this time the wallboard is strong enough to be cut and sawed into finished form.

17. CALIFORNIA EVENTS, TRENDS AND ISSUES

Late in 1983, housing starts increased rapidly creating shortages of wallboard throughout California. Manufacturing facilities were pushed to near maximum capacity and still they could not keep up with the demand. The economic recession has created a large, unfullfilled need for new housing that may take several years of high production to satisfy.

U.S. Gypsum has purchased land on the inland Port of Sacramento in order to build a new manufacturing facility to serve the northern California market. Plans at the present time are to build within several years if a sustained, high volume market persists. The raw material for this future operation will be imported from Nevada.

The most uncertain future event in the California gypsum industry is the possible availability of large quantities of waste byproduct gypsum slurry from the desulfurization of fuels. If this material is available in large quantities it could cause major changes in the mining of natural gypsum.

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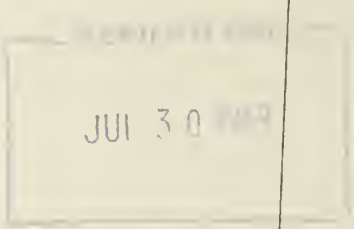

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